Psychosocial Impact of COVID -19 Pandemic on Children

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Abstract

Background: The COVID-19 pandemic has led to unprecedented lockdowns, significantly disrupting the lives of children. These disruptions have raised concerns about their psychosocial well-being, highlighting the need for comprehensive studies to understand these impacts.

Objective: to evaluate the psychosocial effects of the COVID-19 lockdown on children, specifically focusing on anxiety, stress, and quality of life.

Methods: A two time-points cross-sectional survey was conducted with 220 children aged 6-15 years, divided into two groups: 110 assessed during the pandemic (January 2021 to June 2021) and 110 assessed after the pandemic (June 2023 to December 2023). Data were collected using validated questionnaires, including the Generalized Anxiety Disorder 7-item scale (GAD-7), the Patient Health Questionnaire 9-item scale (PHQ-9), the Perceived Stress Scale (PSS), and the WHO Quality of Life (QOL) questionnaire. Salivary cortisol levels were measured as a stress marker.

Results: Among the 220 children, 50.9% of the pandemic group were males and 49.1% were females, with a mean age of 9.14±2.34 years. In the post-pandemic group, 50.0% were males and 50.0% were females, with a mean age of 9.32±2.77 years. Elevated salivary cortisol levels were found in 57.3% of children during the pandemic (mean 776.23±269.96 nmol/L). A significant negative correlation was observed between anxiety levels and quality of life scores (r=-0.452, p<0.001). Children with psychological disorders had significantly higher family sizes (p=0.018) and anxiety scores (p<0.001).

Conclusion: The study underscores the significant psychosocial impact of the COVID-19 lockdown on children, showing increased anxiety and stress that negatively affect their quality of life. These findings highlight the urgent need for targeted mental health interventions to support children during such crises.

Key words: COVID-19, lockdown, children, anxiety, stress, quality of life, mental health, psychosocial impact.

Introduction

The declaration of the COVID-19 outbreaks as a global pandemic by the World Health Organization (WHO) in March 2020 marked the beginning of a worldwide crisis with far-reaching implications, including significant psychological repercussions. Emerging literature has begun to outline the potential mental and emotional strain placed on children as a result of the illness, the implementation of lockdown measures, and the shift to quarantine lifestyles **(Singh, et al., 2020).**

To mitigate the spread of COVID-19 and alleviate pressures on healthcare infrastructures, nations worldwide have adopted rigorous social distancing measures. These have led to the widespread closure of schools, pushing educational systems towards remote learning paradigms **(Alam, et al., 2022).**

Children, while not the face of the pandemic, are among those most deeply affected by these changes. The enforcement of prolonged home confinement, school closures, and the abrupt halt in peer interactions have positioned children in a vulnerable state, susceptible to mental health challenges. Reports indicate a surge in anxiety, stress, depressive symptoms, and sleep disturbances among the younger population **(Ng, C. S. M., et al., 2022).**

Traditionally, schools serve not only as centers for academic learning but also as vital environments for social interaction, teacher support, and access to mental health resources **(Frazier, et al., 2024).** The literature further reveals that periods away from the structured school environment, such as weekends and summer breaks, tend to coincide with reduced physical activity, increased screen time, irregular sleeping patterns, and unhealthier eating habits in children. These factors collectively contribute to weight gain and diminished cardiorespiratory fitness **(Guo, et al., 2021).**

Additionally, pandemic-related stressors, including fear of contagion, feelings of isolation and boredom, informational voids, limited personal space, and economic strains on families, pose significant risks for long-term psychological effects on children **(Cicurated, et al., 2022).** Our study aims to assess the psychosocial impact of the COVID-19 lockdown on children, as it is necessary to understand how children described their experiences, anxiety levels, and perspectives during the COVID-19 pandemic.

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Methods
Study Design
This study utilized a case-control design to assess the psychosocial impact of the COVID-19 lockdown on children., following the declaration of the COVID-19 pandemic. The second time point

Participants
The participants were children aged 6-18 years, recruited from Ain Shams University Hospital outpatient clinic. Cases included were children who experienced lockdown measures due to the COVID-19 pandemic and whose parents/guardians consented to their participation. Children with pre-existing severe psychological disorders diagnosed before the pandemic and children with chronic illnesses were excluded. A matched control group of 110 participants of the same demographics were included.

Sampling Method
A stratified random sampling method was used to ensure a representative sample across different age groups, genders, and socio-economic backgrounds. Participants were stratified into three age groups: 6-10 years, 11-14 years, and 15-18 years. Within each stratum, participants were randomly selected to participate in the study.

Data Collection and outcome measurement
Personal history, including name, age, sex, and residence, was collected from each participant. The Arabic Child Version of the Screen for Child Anxiety Related Emotional Disorders (SCARED) questionnaire was administered with permission from the author (Hariz et al., 2013). This 41-item questionnaire assesses anxiety disorders based on DSM-IV classifications and demonstrates good internal consistency, test-retest reliability, and discriminant validity. For children and parents unable to read or understand the questions, a clinician provided explanations and assistance.

Additionally, the WHOQOL assessment (Al Sayah et al., 2012) was used to evaluate quality of life across various domains, including overall satisfaction, occupation, mental and physical health, financial stability, and substance use. Higher scores indicate better quality of life. All infection control measures were adhered to during the handling of questionnaires. Salivary cortisol was measured as a stress marker using a kit with double antibody sandwich enzyme-linked immunosorbent assay to quantify the level of salivary cortisol in the sample of the case group.

Ethical Considerations
The study was approved by the local Ethics Committee of Ain Shams University, Egypt, in accordance with the declaration of Helsinki and the participating subjects assented prior to recruitment.

Data Analysis
Data were analyzed using SPSS version 26.0 for windows. Descriptive statistics were calculated to summarize demographic information and experiences during the lockdown. Inferential statistics, including t-tests and ANOVA, were used to compare psychosocial outcomes across different demographic groups and lockdown experiences. Regression analysis was conducted to identify predictors of anxiety, depression, stress, and sleep disturbances. All statistical tests were two-tailed, and a p-value of <0.05 was considered statistically significant.

Results
Demographic characteristics
Both groups were comparable in terms of gender (50.9% males and 49.1% females in Group 1; 50.0% males and 50.0% females in Group 2, P= 0.893)) and age (mean age of 9.14±2.34 years in Group 1 and 9.32±2.77 years in Group 2, P= 0.806). The residence distribution showed that 31.8% of Group 1 and 37.3% of Group 2 were from rural areas, while 68.2% of Group 1 and 62.7% of Group 2 were from urban areas (P= 0.478). (Table 1)

Salivary cortisol
The salivary cortisol test, used as a stress marker, revealed that 42.7% of the children in Group 1 had normal cortisol levels, whereas 57.3% had high levels. The mean salivary cortisol level was 776.23±269.96 nmol/L, with a median of 750 nmol/L (IQR: 600-900 nmol/L) and a range from 225 to 1875 nmol/L (Table 1).

SCARED questionnaire
According to results of Child Anxiety Related Emotional Disorders (SCARED) questionnaire, There was a significant higher frequency of separation anxiety score, GAD score, panic disorder score, social anxiety score among participants answering questionnaire during the COVID lockdown compared to those answering after the COVID lockdown era, P<0.001, as shown in (table 2).

WHO QOL questionnaire and different study parameters
There was significant negative correlation between total score of WHO QOL questionnaire with SCARED Score (r=-0.452, p<0.001). whereas no significant associations between age or salivary cortisol and WHO QOL was found

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Table (1): Salivary Cortisol test as one of stress markers among the studied groups.

Parameters		Cases (N= 110)	
		N	%
Salivary Cortisol test	**Normal**	47	42.7%
	High	63	57.3%
Salivary Cortisol test (nmol/L)	**Mean± SD**	776.23± 269.96	
	Median (IQR)	750 (600- 900)	
	Range	225.0 – 1875.0	

SD: standard deviation, IQR: Interquartile range, Normal values for a blood sample taken at 8 a.m. in the morning are 140 to 690 nmol/L

Table (2): Results of SCARED questionnaire among the studied groups.

Parameters		Participants during COVID Lockdown (N= 110)		Participants after COVID Lockdown (N= 110)		Chi- Square test	
		N	%	N	%	Test value	P-value
Questionnaire results	**Separation Anxiety (SOC)**	99	90.0%	42	38.2%	X^2= 220.0	**<0.001**
	Generalized Anxiety Disorder	72	65.5%	2	1.8%		
	Anxiety Disorder (more specific)	58	52.7%	0	0.0%		
	Significant School Avoidance	53	48.2%	25	22.7%		
	Panic Disorder	51	46.4%	5	4.5%		
	Social anxiety Disorder	46	41.8%	9	8.2%		
	Unclassified	23	20.9%	0	0.0%		
	Normal	7	6.4%	53	48.2%		

SD: P value< 0.05 is significant, SD: Standard deviation, IQR: Interquartile range, SOC: Sense of Coherence
X^2= Chi- Square test, $z_{MWU:}$ Mann-Whitney U test

Table (3): Correlation between total score of WHO QOL questionnaire and different parameters.

	Total score of WHO QOL questionnaire	
	r	P-value
Age	0.096	0.156
Salivary Cortisol test	-0.108	0.263
SCARED Score	-0.452	**<0.001**

Discussion

The COVID-19 pandemic and subsequent lockdown measures have profoundly impacted the mental health and daily lives of children worldwide. This study aims to assess the psychosocial effects of the lockdown on children, focusing on anxiety, stress, and overall quality of life. Understanding these impacts is crucial for developing effective mental health interventions and support systems.

Our study found that 57.3% of children assessed during the COVID-19 pandemic exhibited elevated salivary cortisol levels, with a mean cortisol level of 776.23 nmol/L. This aligns with existing literature suggesting that significant stressors, such as a global pandemic, can increase cortisol levels in children **(Taylor, et al., 2022)**. Elevated cortisol levels have been associated with heightened anxiety and stress, reflecting the physiological response to prolonged confinement and disruption of daily routines **(Cay, et al., 2018)**. Conversely, some studies have reported no significant changes in cortisol levels among children during the pandemic, suggesting variability

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based on individual and contextual factors such as family support and coping mechanisms **(Hastings, et al., 2021).** The discrepancy highlights the complex interplay between stressors and biological stress responses, indicating the need for further research to identify moderating variables.

Our findings revealed a significant negative correlation between the SCARED score and the WHO Quality of Life (QOL) questionnaire scores, indicating that higher anxiety levels were associated with a lower quality of life. This is consistent with studies by **Mohajerani, et al. (2023)**, which documented a decline in quality of life and mental well-being among children during the pandemic due to increased anxiety and depression. However, some studies have reported a resilience in children's quality of life, with minimal impact observed, potentially due to strong family support systems and adaptive coping strategies **(Yang, et al., 2022).** The variance in findings across studies underscores the role of environmental and social factors in buffering the negative impacts of the pandemic on children's well-being.

In our study, a higher proportion of females (85.7%) were found among children without psychological disorders compared to those with psychological disorders (46.6%), though this difference was not statistically significant. This finding is somewhat contradictory to prior research which often suggests that females are more likely to experience anxiety and depression **(Salk, et al., 2017).** The lack of significant difference in our study may be attributed to the unique stressors of the pandemic affecting children irrespective of gender. Furthermore, the distribution of psychological disorders was similar across urban and rural settings, aligning with some studies indicating that the impact of the pandemic transcends geographical boundaries **(Forrest, et al., 2023).**

In the current study, children with psychological disorders had significantly higher family sizes and SCARED scores. The finding that larger family size correlates with psychological disorders contrasts with some studies that suggest larger family networks can provide better emotional support during crises **(Baldus, et al., 2022).** The higher SCARED scores among children with psychological disorders are consistent with existing literature highlighting increased anxiety and stress during the pandemic **(Marques de Miranda, et al., 2020).** This suggests that, despite some protective factors associated with larger families, the pandemic's unprecedented nature may overwhelm these supports, leading to higher anxiety levels.

Strengths and Limitations

A key strength of this study is its robust sample size and the inclusion of children from diverse backgrounds, allowing for a comprehensive analysis of the psychosocial impacts of the COVID-19 lockdown. The use of validated tools for measuring anxiety, depression, stress, and quality of life enhances the reliability of our findings. Additionally, the study's comparison between data collected during and after the pandemic provides valuable longitudinal insights. However, limitations include the reliance on self-reported data, which can introduce bias, and the cross-sectional design, which limits the ability to infer causality. Furthermore, the study did not account for potential confounding variables such as pre-existing mental health conditions and family socioeconomic status, which could influence the outcomes.

Conclusion

Our study highlights the significant psychosocial impact of the COVID-19 lockdown on children, with increased anxiety and stress levels correlating with a lower quality of life. These findings underscore the need for targeted mental health interventions and support systems to mitigate the adverse effects of such unprecedented disruptions on children's well-being. Future research should explore longitudinal effects and consider additional variables to provide a more nuanced understanding of these impacts.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Ethics approval and consent to participate

This study was approved by the Institutional Review Board and the Ethical Committee of Faculty of Medicine, Ain Shams University according to the WMA Declaration of Helsinki (FWA 000017585): Approval Number **MD 80/2021**

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Each participant was required to provide an informed written consent prior to enrollment.

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